

*satellite speaker*

## operation manual

**LCR-851/CENTER-851**  
**LCR-850/CENTER-850**  
**LCR-651**  
**LCR-650**



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**THIS MANUAL APPLIES TO:**



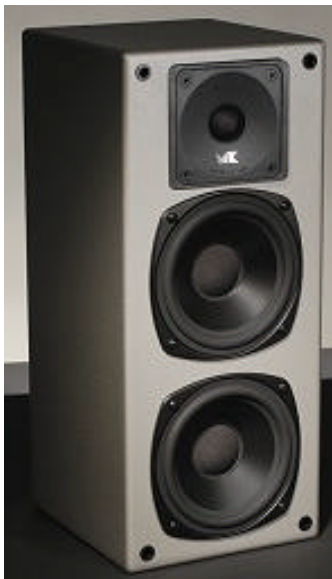
LCR 650 shown in Light Cherry



LCR 651 Shown in Titanium



LCR 850 in Lt. Cherry



LCR 851 in Titanium



Center 850 in Lt. Cherry



Center 851 in Titanium

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Please record the following information for your records:

Serial Number: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Dealer Name: \_\_\_\_\_

Dealer Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Country: \_\_\_\_\_

Invoice Number: \_\_\_\_\_

## 1. INTRODUCTION

Congratulations! Your new M&K speaker system will give you years of unmatched enjoyment and excitement while listening to your favorite musical and audio/video sources.

We encourage you to read this owner's manual, as there is a great deal of information provided here to help you achieve the best possible performance.

If you have any questions about your speaker system, please contact your M&K dealer or call the M&K factory directly at (818) 701-7010, from 8:30 AM to 5:00 PM Pacific Time, Monday through Friday. You may also send us an e-mail to [support@mksound.com](mailto:support@mksound.com). We will be happy to help you with any question you may have.

This manual gives you basic hook-up instructions first, followed by more detailed technical, installation, and service information.

## 2. PLACEMENT OF YOUR M&K SPEAKERS

Your speakers can be installed in a wide variety of locations. They can be placed on stands, shelves, or book-cases, or permanently mounted using brackets, direct wall attachment, or a ceiling suspension system.

Your speakers have threaded mounting hardware permanently mounted into the cabinet in different locations on the speaker's back baffle. These allow you to mount the speakers in a wide variety of locations, and to orient them for the best possible sound. There is a two hole pattern using inserts threaded for 1/4 - 20 hardware (1/4 inch in diameter, and 20 threads per inch), and a single 3/8" threaded insert. See Figure 3 for wall bracket and stand options. These mounting patterns accommodate M&K speaker stands and mounting brackets. These mounting holes can also be used to attach the speakers to Omnimount brackets.

You can place your speakers virtually anywhere in the room, but certain locations are better than others. In general, locate them away from obstructions that would interfere with the direct path from the speakers to your ears (such as walls, furniture, lighting, plants, etc.). They will sound better when they are around ear height, or when angled towards your favorite listening location.

The 851 and 850 series satellite speakers are all magnetically shielded. This means that they can be placed close to a television monitor without distorting the picture. If some slight discoloration or picture distortion occurs, you may need to move the speaker a few inches or to separate the speaker from the television. Call the factory if you have problems.

**NOTE:** The 651 and 650 series speakers are not magnetically shielded.

For more detailed placement information, see Section 7 on page 6.

## 3. SPEAKER HOOK-UP

The sound quality that you get from your speakers can be affected by the type of speaker wire that you use to connect them. While it is possible to use speaker wire as thin as 22 gauge to hook your speakers up, wire of less than 16 gauge will compromise their sound quality. We strongly recommend using the heaviest gauge wire possible. Your special M&K 5-way binding post input terminals will directly accept wire as heavy as 4 gauge!

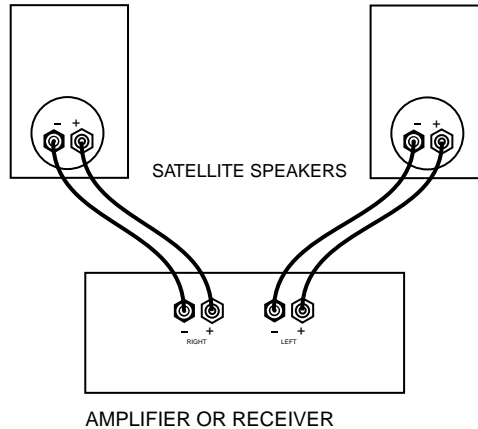
For wire runs of up to 20 feet, 16 gauge wire is acceptable. For runs up to 30 feet, you should use a minimum of 14 gauge. For up to 40 feet, use a minimum of 12 gauge, and over 40 feet should use 10 gauge.

There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend the highest quality cable that fits your budget. Beware, though — with cables, expensive is not always better. If you have any questions, contact your M&K dealer for advice.

## WIRING

The Positive ( + ) lead from your amplifier or receiver should be connected to the RED ( + ) "INPUT" terminal, and the Negative ( — ) lead from your amplifier or receiver should be connected to the BLACK ( — ) "INPUT" terminal. See Figure 1 below.

**FIGURE 1**



## 4. THE M&K HIGH-FREQUENCY PRISM SYSTEM (850 and 650 series only)

Your LCR-850, Center-850, and LCR-650 speakers utilize M&K's exclusive High-Frequency Prism System to optimize imaging and coverage of sound throughout the listening area. This system is designed to take into account the effect of the curved mesh metal grilles on your speakers. Therefore, your speakers are designed for the best sound when the grilles are in place. We recommend that you leave the grilles on the speakers for all listening.

You will note that the tweeter in your LCR-850, Center-850, and LCR-650 speakers is mounted at a slight angle (4.7 degrees). This mounting is an integral part of the High-Frequency Prism System.

When the speakers are mounted properly, the tweeter will be angled away from the listening position. That means that the left and right channel speakers should be placed with the tweeter angled towards the nearest side wall. The left channel speaker's tweeter should point towards the left wall, and the right channel speaker's tweeter should point towards the right wall.

The center channel speaker should be placed with the tweeter pointing up when it is sitting above the listening position (such as when it sits on top of a projection television set). The center channel speaker should be placed with the tweeter pointing down when it is placed underneath the television screen.

When the speaker is mounted as described above, its stereo imaging and coverage of sound are optimized for a very wide listening window that extends from the on-axis position towards the center of the room. If the speaker is mounted with the tweeter pointed in the other direction, its sound quality will be adversely affected.

The 851 and 651 series speakers have a fabric grille and therefore do not use the High-Frequency Prism system.

## 5. CENTER-850 CENTER CHANNEL HIGH-FREQUENCY PRISM

The Center-850 is designed to match the LCR-850 so all instructions apply to both speaker versions. The Center-850 is designed to be oriented horizontally and located above or below your television screen. For more discussion of center channel speaker placement, see CENTER CHANNEL on page 7.

If the center speaker is located horizontally above the TV, the tweeter should be angled up and if the speaker is located below the TV than the tweeter should point down. This does not apply to the Center-851 or Center-651 speaker.

## **6. OPTIMIZING SPEAKER PLACEMENT**

The sound quality produced by your speakers can be significantly enhanced by careful attention to their placement. While we understand that you may not redesign your room to accommodate your speakers, coming as close as possible to the ideal placement will give you much better sound.

The left and right channel speakers can be oriented either horizontally or vertically. The center channel speaker is designed for horizontal orientation (tweeter and woofer drivers next to each other), and can be angled (vertically) towards your listening position.

Three factors are important in getting the best sound. They are:

- A. Height (or angle).
- B. Location away from room walls or reflecting surfaces.
- C. Separation between Left and Right speakers.

### **A. HEIGHT (OR ANGLE)**

Your M&K speakers will always deliver sound superior to conventional speakers, regardless of where you locate them. However, because they are designed for very fast and accurate transient response, they achieve even better sound quality, and the flattest frequency response when properly oriented relative to your ear.

Ideally, the tweeter should be at the same height from the floor as your ears, when you are sitting in your main listening position.

If you have the speakers mounted above or below this height, they sound their best when you angle the speakers so that the tweeters are aimed at your ears when you are in the main listening position.

### **B. LOCATION AWAY FROM REFLECTING SURFACES**

Your speakers should be located, whenever practical, away from walls, the floor, furniture, or any other reflecting surfaces. Do the best you can. Objects close to the speaker will reflect sound, and this reflected sound arrives at your ear slightly later than the direct sound, which blurs sonic imaging and makes transients seem muted.

The delay is very slight, so instead of hearing an echo, you hear a "blurred" sound with less clarity that is not as sharp and distinct as it should be. This time delay also affects frequency response and sonic imaging.

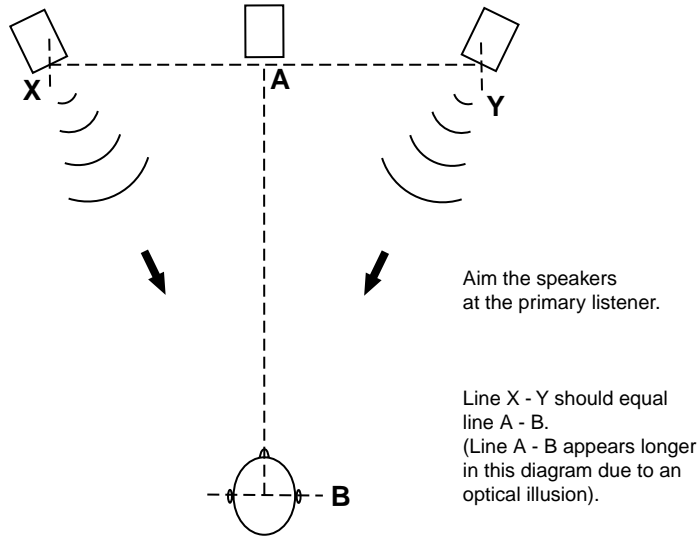
If the speakers are on a television set or shelves, locate them on the front edge, so there is no flat surface directly in front of them. If the speakers will sit close to walls or other large objects, leave as much space as possible between the speaker and the object. Ideally, your Speakers will be several feet from the nearest surface, but in most rooms compromise is necessary.

### **C. SEPARATION BETWEEN LEFT AND RIGHT SPEAKERS**

Here is a formula for achieving the ideal left to right stereo imaging. Think of a triangle formed by the locations of the Left and Right speakers and your listening position. Ideally, the subtended angle formed should be between 45 and 50 degrees. Roughly, this means that the Left and Right speakers should be separated by about the same distance that you are sitting back from the speakers. In other words, if the distance from your listening position to the point directly between the speakers is 10 feet, place the speakers so their centers are 10 feet apart. See Figure 2.

On Figure 2, the length of line A - B should be about the same as the length of line X - Y. (They may not seem to be the same in this diagram due to an optical illusion).

**FIGURE 2**



Try to follow the formula as close as you can. You can fine tune the placement by listening to a source with an image (such as a vocalist) centered between the speakers. When listening in stereo (no Center Channel speaker), move the speakers closer together or farther apart in small increments until you hear the sharpest and most cohesive image, especially in the phantom center. You may also want to angle (or "toe-in") the speakers slightly. This often improves the sharpness of the stereo image, reduces room colorations, and provides a wider seating area. The angled front baffles of your speakers also provide this benefit.

## 7. HOME THEATRE USAGE

### LEVEL-MATCHING

The factor most critical to achieving excellent Home Theatre performance is level-matching the three front and two surround channels. This is even more important than timbre-matching. We strongly recommend that you purchase a Radio Shack Sound Level Meter (get the analog meter, not the digital version) and use it to measure the output of the speakers when playing the test tones generated by your processor or receiver.

Set the meter to the "C" weighting scale and the "SLOW" setting. Using your amplifier or receiver's internal noise calibration test, set the levels so that all channels measure the same level. **WHENEVER POSSIBLE, DO NOT CALIBRATE LEVELS BY EAR!** Using a meter is an inexpensive way to be certain that your system is calibrated properly.

### TIMBRE-MATCHING

One of the most important factors in achieving excellent Home Theatre performance is timbre-matching. On film soundtracks, specific sounds are often moved from left to right or from front to back in the room. When the speakers reproducing these sounds have dissimilar characteristics, there will be an audible discontinuity when the sound shifts from one speaker to another.

Timbre-matched speakers have very similar tonal characteristics and sound, which come from three critical elements: similar or identical drivers; similar or identical crossovers; and similar or identical frequency response. In full M&K systems, these elements have been addressed. You can be assured that the system can achieve the full potential of Home Theatre sound.

When you have a Home Theatre system, speaker placement becomes extremely important, as you will be balancing four or five (or more) speakers rather than two. The following guidelines are for a five-channel Pro-Logic or 5.1 channel Dolby Digital AC-3 system, but if you do not have a Center channel, the instructions for the other four channels still apply.

## **CENTER CHANNEL**

The Center channel speaker in any multichannel system is the most important speaker in the system. This speaker often produces more output than the left and right speakers combined. This speaker should be of the highest possible quality, and as similar as possible in response and radiation pattern to the left and right speakers. Three identical speakers are best, unless the center channel is designed to work with a set of left and right speakers.

It is also important to have as much amplifier power as possible for the Center channel. As a minimum, the three front channels should be identical in power output, but it is better if the Center channel has more. If you have less power in the Center channel, this will be the limiting factor in the total output capability of the system when watching and listening to video sources.

The Center channel speaker should be located as close as physically possible to the television or projection screen, preferably just above or below the screen. If that is not possible, then just to the left or the right of the screen may be acceptable. M&K's Phase-Focused crossover will always give you smooth and even coverage throughout the room.

If the television is not in the center of the room (or not centered between the Left and Right speakers), the Center channel speaker should still be as close as possible to the screen -- even if it is outside the left and right speakers (such as a TV located in a corner of the room outside the stereo spread of the left and right speakers). Good results can be achieved in unusual configurations when the Center speaker is as close as possible to the screen.

The Left and Right front channel speakers in a Home Theatre system should be placed the same as the left and right speakers in a stereo setup. Some listeners, however, may prefer to reduce the distance between the left and right speakers to bring the size of the acoustic image closer to the size of the screen image.

For example, with a 25" direct-view television, you would want the speakers closer together than you would with a 100" projector. One recommendation is to separate the speakers by 1.5 times the diagonal screen size; another is to place the left and right speakers to create a 45 degree angle with the main listening position.

There is a great deal of latitude in this area, as it is one of personal preference (especially if you will listen to music without video).

It is also preferred that the speakers be equidistant from the listening position. Equidistant usually means that when the center speaker is on top of the television, the left and right speakers will sit in front of the set (they will be farther from the wall behind the TV than the center speaker). Ideally, the speakers should be at the same height as the screen, but it is much more important that all three speakers be at as close to each other's height as possible. If the center is much higher or lower than the other speakers, the effect can be distracting. Angling, or toeing-in the speakers, to aim at the listening position often improves imaging.

When using a Center channel speaker, you have extra flexibility in placing the left and right speakers, as the Center channel speaker will tie most dialog and effects directly to the screen.

## **SURROUND CHANNELS**

Surround speakers can be installed in a wide variety of locations, but in some rooms their installation can be quite a challenge to install. If you have any questions, please don't hesitate to contact your M&K dealer or the M&K factory. We will be happy to discuss your system with you.

We recommend placement of the surround speakers on the side walls of the room, two to three feet above the listeners' heads, either directly adjacent to the listening position or behind it. You can aim the speakers to fire towards each other (across the listening area), or you can aim them to fire towards the back wall at an angle. The surround speakers should not be in front of the main listening position if possible.



If you mount the surrounds on the side wall behind the listening position, they can be aimed towards each other or angled towards the back wall or the side wall surface directly behind them. By reflecting sound behind the listening position, you may increase the sense of envelopment in the sound.

If you want or need to mount speakers on the back wall of the room, there are several options. You can aim them so that they fire towards each other (so they fire along the back wall); you can aim them towards the front wall of the room; or you can angle them so they fire toward the side walls. Symmetrical arrangements work best.

The speakers should be a minimum of a few feet away from the nearest listener. Ideally, the surround speakers should not call attention to themselves as separate sources of sound.

If the surrounds must be located close to the listeners, aiming them at the room walls or even the ceiling can help to reduce any directional effect. As described above, this can produce a desirable result even in rooms where the surround speakers are an adequate distance from the listeners' heads.

If the surrounds cannot be placed on a wall, try placement on tables or the floor to the sides of the main listening position, firing up towards the ceiling. This can work very well in environments that do not allow permanent attachment of speakers to the walls.

Some listeners prefer to use multiple pairs of surround speakers. While this is not necessary, it can provide a broader and deeper surround effect, with better coverage in very large rooms. When using multiple pairs of surround speakers, a symmetrical installation pattern works best. For example, if you are using two pairs of surround speakers, one pair could be mounted on the back wall of the room, mounted equidistant from the back corners, with the other pair mounted on the side walls of the room, equidistant from the same back corners.

The surround channels can be installed in a wide variety of locations, but because they are usually mounted on the walls of the room, they can be a challenge to successfully install. If you have further questions, please call us at the M&K factory, and we will be happy to discuss them with you in detail.

## **SUBWOOFER**

Subwoofer location for Home Theatre systems is essentially the same as for music systems. See our Subwoofer operation manual for more details. Remember to leave 2 - 3 feet of clearance between any television and subwoofer, unless the subwoofer is magnetically shielded.

The preferred connection for the subwoofer is a subwoofer output from the amplifier or controller. This insures that a full bass signal is being fed to the subwoofer. If you do not have such a subwoofer output jack, connect the subwoofer to the front Left and Right channel amplifier outputs (do not use the Center channel).

**IF YOU ARE CONNECTING YOUR SUBWOOFER TO THE AMPLIFIER OUTPUTS:** When the Subwoofer is connected to the Left and Right amplifier outputs, and the controller is in Pro-Logic mode, the switch on the Pro-Logic control unit labelled Center channel WIDE/NORMAL must be set to the NORMAL mode. If the switch is set to the WIDE mode, the bass content of the Center channel will not be fed to the Subwoofer, and you will lose a significant amount of bass.

## **9. SATELLITE/SUBWOOFER PHASING TEST**

In any system using a subwoofer separate from Main speakers, a phasing test must be performed to insure good bass blending. This test insures optimum sound in the critical bass frequencies where your Subwoofer and Main speakers overlap.

Play a familiar CD, DVD, LP, or tape with steady, consistent bass content through your system. Listen carefully to the "mid-bass" region of 75 - 125 Hz. This is the part of the spectrum where electric or string basses and drums predominate. Then reverse the phase of either the subwoofer or BOTH Main speakers.

If your Subwoofer has a PHASE switch on its back panel, move it either from (+) to (—) or vice versa.

If your Subwoofer does not have a PHASE switch, it takes a bit more work. You will have to change the Positive and Negative speaker inputs on the back of BOTH Main speakers.

You can do this at the back of both Main speakers, or at the Subwoofer's TO SPEAKERS terminals, but never at both locations. The lead that was on the Positive (+) terminal should be switched to the Negative (—) terminal, and vice versa. When switching speaker wires, take care to protect your amplifier. Make sure that the wires do not touch each other when you are making the switch. As a safety measure, we suggest that you turn the amplifier off before making the switch.

Now listen to the same musical passage as you did earlier, concentrating on the mid-bass region. If you hear less bass, the original connection (or switch position) was correct. If you hear more bass, the new connection (or switch) is correct.

You need to perform this test because when Main speakers are located separate from a Subwoofer, each speaker is at a different distance from your ear. In some cases, the difference will be just enough so that the output from the Subwoofer arrives out of phase with the output of the Satellites. When this happens, that critical mid-bass is actually cancelled. You should re-do this test any time you move your speakers.

If you want to experiment further, move the Main speakers either towards or away from your listening position, making changes in small increments. This will "focus" the system's sound to its optimum. When you hear the best combination of stereo image localization and maximum impact and output in the mid-bass, you have the ideal location.

### 8. USE WITH M&K STANDS & BRACKETS

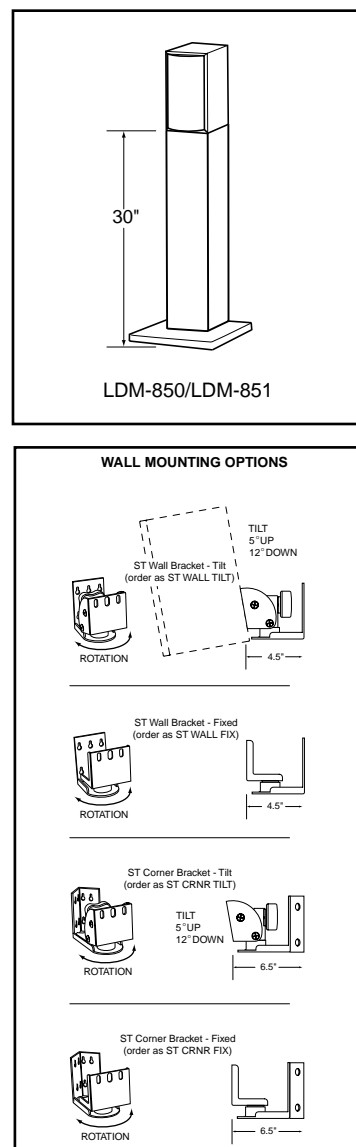
The LCR-850/851/650/651 and Center-850/851 speakers contain threaded inserts on their back baffles. One set has two 1/4-20 inserts and the other is a single 3/8" insert. You can use either of these to securely attach the speakers to an M&K LDM-850/851 stand, and M&K ST-series speaker stand, or M&K ST wall-mount brackets. Both the M&K stands and brackets offer tremendous flexibility for installation in a wide variety of environments, and both are available in several configurations. This mounting scheme can also be used with Omnimount brackets.

### 10. SPEAKER DAMAGE & HOW TO AVOID IT

An important factor to consider with any loudspeaker system is the potential for speaker damage. Even though your M&K Speakers have extremely high power handling ability (especially for Main speakers), they still can be damaged by relatively low powered amplifiers.

While very few M&K Speakers are actually returned for service, the vast majority of those returned are not for manufacturing defects. Instead, they are returned because they have been overdriven, almost always because the amplifier or receiver used was driven into clipping distortion. This damage is considered abuse, and is not necessarily covered under warranty.

**FIGURE 3**



This clipping distortion occurs when the demands of the music are greater than the amplifier's available power. It can occur at 20 watts with a small amplifier, or at 400 watts with a large amplifier. When this happens, the amplifier's output waveform (which should look like a smooth arc) is "clipped" off, exhibiting a flat top instead of the arc.

This "clipped" waveform contains multiples of the original amplified frequencies, sometimes at higher levels than the original signal itself. For tweeters, this can be very damaging, as this distortion is well above the audible range (where you are unable to hear it), and where the tweeter is most vulnerable to damage.

When an amplifier "clips", it generates a high level of high frequency energy (much higher than normal program material) which passes through the crossover to the tweeter. This energy can overheat the tweeter in a matter of seconds and destroy it.

When this happens, the sound becomes harsh and grating, and a break-up is often audible in the bass frequencies. It will become uncomfortable to listen to, especially when compared to a slightly lower volume level. When you are listening at high volume levels, be aware of the onset of clipping distortion, and turn the volume down slightly if the sound takes on the character described above.

When tone controls or equalizers are used to boost frequencies, the problem occurs much more rapidly. Even a small boost of low or high frequencies can easily double the power requirement and lead to amplifier clipping at moderate levels. Therefore, you should use your tone controls judiciously, avoiding extreme boosts of the bass and treble controls, especially when you are listening at high volume levels.

The best way to avoid speaker damage is to use common sense. Use moderate boosts of tone controls or equalizers, at the very most. Listen carefully for any harshness and break-up, especially at high volume levels, and turn down the volume when needed. If you cannot get enough volume, you may need to consider a higher-powered amplifier. If you have any questions about this, please contact M&K, and we will be happy to discuss it with you further.

## **11. M&K 10 YEAR WARRANTY**

All M&K Satellite speakers carry a ten year limited parts and labor warranty. This warranty is transferable to new owners up to ten years from the date of original purchase. It does not cover abuse, misuse, repairs by unauthorized service stations, speakers without M&K serial numbers, speakers not sold by authorized M&K dealers, and those damaged in shipping or by accident. If you have any questions about the warranty, please contact M&K.

## **12. IF YOU NEED SERVICE OR SET-UP ASSISTANCE**

Contact your dealer or M&K with a complete description of the problem. Please have the unit's model and serial numbers (found on the back of the cabinet), date of purchase, and your dealer's name. You can call M&K between 8:30 AM and 5:00 PM Pacific Time, Monday through Friday, at (818)701-7010 or send an e-mail to [service@mkound.com](mailto:service@mkound.com). If you call outside these hours, leave a message, and we will return your call promptly.

# **DO NOT RETURN YOUR SPEAKERS TO THE FACTORY FOR SERVICE WITHOUT OBTAINING PRIOR AUTHORIZATION**

## **13. CABINET MAINTENANCE**

Treat the cabinet as you would any piece of fine furniture. Its black vinyl finish does not require any special maintenance; regular dusting with a lint-free cloth and periodic cleaning is all that is required. Do not use any solvent based cleaners, as they may damage the cabinet surface.

## 14. SPECIFICATIONS

**These specifications apply to both the LCR-851 & Center-851, except as indicated:**

IMPEDANCE	4 ohms
MINIMUM POWER:	10 watts RMS
RECOMMENDED POWER:	amplifiers with between 25 and 200 watts RMS or more (see below)
MAXIMUM POWER:	200 watts RMS unclipped peaks
FREQUENCY RESPONSE:	80 Hz - 20 KHz $\pm$ 2 dB
MAGNETICALLY SHIELDED:	Yes
DIMENSIONS (H x W x D):	16" x 6.9" x 8.625" (LCR-851) 6.9" x 16" x 8.625" (Center-851)
WEIGHT:	16 lbs.

**These specifications apply to both the LCR-850 & Center-850, except as indicated:**

IMPEDANCE	4 ohms
MINIMUM POWER:	10 watts RMS
RECOMMENDED POWER:	amplifiers with between 25 and 200 watts RMS or more (see below)
MAXIMUM POWER:	200 watts RMS unclipped peaks
FREQUENCY RESPONSE:	80 Hz - 20 KHz $\pm$ 2 dB
MAGNETICALLY SHIELDED:	Yes
DIMENSIONS (H x W x D):	16" x 6.9" x 8.625" (LCR-850) 6.9" x 16" x 8.625" (Center-850)
WEIGHT:	17 lbs.

**These specifications apply to the LCR-651**

IMPEDANCE	8 ohms
MINIMUM POWER:	10 watts RMS
RECOMMENDED POWER:	amplifiers with between 25 and 200 watts RMS or more (see below)
MAXIMUM POWER:	200 watts RMS unclipped peaks
FREQUENCY RESPONSE:	87 Hz - 20 KHz $\pm$ 2 dB
MAGNETICALLY SHIELDED:	No
DIMENSIONS (H x W x D):	10.3" x 7" x 8.6"
WEIGHT:	10.25 lbs.

**These specifications apply to the LCR-650**

IMPEDANCE	8 ohms
MINIMUM POWER:	10 watts RMS
RECOMMENDED POWER:	amplifiers with between 25 and 200 watts RMS or more (see below)
MAXIMUM POWER:	200 watts RMS unclipped peaks
FREQUENCY RESPONSE:	87 Hz - 20 KHz $\pm$ 2 dB
MAGNETICALLY SHIELDED:	No
DIMENSIONS (H x W x D):	10.3" x 7" x 8.6"
WEIGHT:	10.25 lbs.

